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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/754,040	12/27/2000	Ronen Zohar	42390.P10416	3337

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EXAMINER	
NGO, CHUONG D	

ART UNIT	PAPER NUMBER
2124	

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/754,040	ZOHAR, RONEN	
	Examiner	Art Unit	
	Chuong D Ngo	2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-10,12-16 and 18-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) *22-29* is/are allowed.

6)☒ Claim(s) *1,5-10,12-16 and 18-21,30 and 31* is/are rejected.

7)☒ Claim(s) *3 and 4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 10,12-15 and 31 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 10,12-15 and 31 clearly recites a method for computing an approximate value 2^X according to a mathematical algorithm. In order for such a claimed process to be statutory, the claims must include either a step that results in a physical transformation outside the computer or a limitation to a practical application. However, it is clear from claims 10,12-15 and 31 that the claims merely recite steps of data computation and manipulation. The input is a number and output is also a number. The claims fail to recite any step that results in a physical transformation outside the computer or a limitation to a practical application. Further, the claims also fail to include any limitation that requires a specific computer to implementing the claimed process. Accordingly, claims 10,12-15 and 31 are clearly directed to a non-statutory subject matter.

3. Claim 18 is objected to because it should not depend on a succeeding claim. Appropriate correction is required.

Claims 10,12-15,30 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 10, it is indefinite as to whose the "second rounded value", line 5, is.

As per claim 30, the recitation "$X_{floating\ point}$ is (X) rounded using a floor technique", lines 5-6, is indefinite as to how $X_{floating\ point}$ is obtained from (X).

As per claim 31, it is indefinite as to whose the "first rounded value", line 2, is

4. Claims 1,5,6,8,10,14-16,19, and 20 stand rejected under 35 U.S.C. 102(e) as being clearly anticipated by Schmookler (6,178,435).

Schmookler discloses a computing system (figure 3) having a first approximation apparatus (37, see col. 4, lines 20-30) for approximating a term 2^X, a memory (21) for storing a computer program, and a central processing unit (30). The first approximation apparatus (see figure 1) including means (11), corresponding to the claimed rounding apparatus, for generating xI, as the claimed rounded value $X_{integer}$, and subtracting xI from x to generate xF as the claimed ΔX, and xF clearly equals to $X - X_{floating\ point}$ as defined by the claims, means (13), corresponding to the claimed shift-left operator, for left shifting (xI) to the exponent bit positions, means (14), corresponding to the claimed second approximation apparatus, accepting xF, as the claimed ΔX, for generating yF as the claimed $2^{\Delta X}$, which can be seen as representing in floating-point with the exponent equal zero, means (15), corresponding to the claimed integer addition operator, for providing a result y equaling an integer addition of the left shifted xI to the exponent bit positions and yF as claimed.

5. Claims 7,13, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmookler (6,178,435).

It is noted that Schmookler does not disclose the generation of yF as the claimed 2^{nx} by Horner=s method. However, since Horner=s method for approximating 2^{nx} are well known in the art, it would have been obvious design choice to a person of ordinary skill in the art to apply Horner=s method in generating 2^{nx} as claimed.

6. Claims 9 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmookler (6,178,435) in view of Abe et al. (6,049,343).

It is further noted that Schmookler does not disclose a third approximation apparatus for approximating a term C^Z as claimed. However, Abe et al. discloses in figure 1 the same approximation. It would have been obvious to a person of ordinary skill in the art to apply the teaching of Abe et al. in Schmookler in order generating a power calculation C^Z at high speed.

7. Claims 3 and 4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claims 22-29 are allowed.

9. Applicant's arguments filed on 07/12/2004 have been fully considered but they are not persuasive.

According to the teachings that "the value of a floating point number x can be partitioned into the sum of two parts, namely, a signed integer xI and a positive fraction xF.... $0 \leq xF, < 1$" (col. 2, lines 45-49), and "if the sign of x is negative, the partitioned mantissa is replaced by its 2's complement" (col.3, lines 21-22). Clearly, Schmookler does not teach separately 2's complementing xI and xF, but the mantissa as a whole. Thus, xI in Schmokler would be the integer part of the input values or of the complement of the input value. For example, if x = -2.25 which is - 010.010 in binary, where the decimal point is the partition point, the mantissa 010.010 is first 2's complemented to become 101.110 since the sign of x is negative. The integer part xI would be 101 or -3 in decimal and which is clearly equal to -2.25 rounded to floor or toward minus infinity, and the fractional part xF would be .110 or .75 which is clearly equal to -2.25 - (-3) = .75 regardless the format they are represented.

Further, since Schmookler does not disclose an approximation of a term C^Z, but Abe et al. discloses the approximation by further providing the exponent calculation unit (130) of any base with a logarithm calculation unit (110) of the same base and a multiplier (120) as shown by figure 1, it would have been obvious to a person of ordinary skill in the art to apply the teaching of Abe et al. in Schmookler in order generating a power calculation C^Z at high speed.

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong D Ngo whose telephone number is (703) 305-9764. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (703) 309-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chuong D Ngo
Primary Examiner
Art Unit 2124

09-29-2004